10/542867 JC14 Rec'd PCT/PT0 20 JUL 2005 JC14 Rec'd PCT/PT0 20 JUL 2005 Docket No. 480230.401USPC

1/49

SEQUENCE LISTING

- <110> National Agricultural Research Organization
- <120> JUVENILE HORMONE TRANSMETHYLASE GENES
 AND METHOD OF USING THE SAME
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- <160> 36
- <170> PatentIn version 3.1
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85 90 95

288

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Ile	Tyr	Asn	Leu	Leu	Lys	Pro	Glu	Gly	Gly	Asp	Cys	Leu	Leu	Ala	Phe	
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Ala	Arg	Lys	Thr	Pro	Glu	Phe	Val	Asn	Asn	Val	Phe	Leu	Glu	Pro	Thr	
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Ser Asp Gly Glu Asp Ala Leu Leu Asp Val Gly Ser Gly Asn
35 40 45

Val Leu Met Asp Phe Val Lys Pro Leu Leu Pro Ile Arg Gly Gln Leu
50 55 60

Val Gly Thr Asp Ile Ser Ser Gln Met Val His Tyr Ala Ser Lys His

70

75

80

Tyr Gln Arg Glu Glu Arg Thr Arg Phe Gln Val Leu Asp Ile Gly Cys

85 90 95

Glu Arg Leu Pro Glu Glu Leu Ser Gly Arg Phe Asp His Val Thr Ser

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Phe Tyr Cys Leu His Trp Val Gln Asn Leu Lys Gly Ala Leu Gly Asn 115 120 125

Ile Tyr Asn Leu Leu Lys Pro Glu Gly Gly Asp Cys Leu Leu Ala Phe
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Leu Ala Ser Asn Pro Val Tyr Glu Val Tyr Lys Ile Leu Lys Thr Asn 145 150 155 160

Asp Lys Trp Ser Thr Tyr Met Gln Asp Val Glu Asn Phe Ile Ser Pro

165 170 175

Leu His Tyr Ser Leu Asn Pro Gly Glu Glu Phe Ser Gln Leu Leu Asn
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Asp Val Gly Phe Val Gln His Asn Val Glu Ile Arg Asn Glu Val Phe
195 200 205

Val Tyr Glu Gly Val Arg Thr Leu Lys Asp Asn Val Lys Ala Ile Cys
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Pro Phe Leu Glu Arg Met Pro Ala Asp Leu His Glu Gln Phe Leu Asp 225 230 235 240

Asp Phe Ile Asp Ile Val Ile Ser Met Asn Leu Gln Gln Gly Glu Asn
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Asn Glu Asp Gln Lys Phe Leu Ser Pro Tyr Lys Leu Val Val Ala Tyr
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Gln	His	Val	Ala	Phe	Ser	Asn	Ile	Tyr	Asn	Leu	Leu	G1n	His	Gly	Gly	
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		tac	att Ile	165 tcg	ccc	tac	cag	tat Tyr	170	gaa	aat	cca	gca Ala	175 agt	gag	576
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Glu	Lys	tac Tyr gat	att Ile 180	tcg Ser	ccc Pro	tac Tyr acg	cag Gln gtg	tat Tyr 185	170 tgt Cys	gaa Glu	aat Asn cag	cca Pro	gca Ala 190 cag	agt Ser	gag Glu cag	

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Asp	Arg	Phe	Leu	Leu	Asp	Tyr	Ile	Ala	Val	Val	Arg	Gln	Met	Tyr	
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Pro	Tyr	Lys	Leu	Val	Val	Val	Tyr	Ala	Lys	Lys					
	275					280									
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Arg Asp Gly Glu Glu Val Ala Leu Leu Asp Ile Gly Cys Gly Ser Gly
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His Ala Arg Glu Ser Tyr Arg His Val Lys Thr Ile Glu Phe Asp Thr

85 90 95

Leu Asp Ile Gly Ile Lys Leu Asp Ser Ala Lys Leu Ser Arg Trp Gly

100 105 110

Gln Phe Ser His Val Thr Ser Phe Tyr Cys Leu His Trp Val Gln Asn 115 120 125

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Asn Gln Leu Ser Arg Ser Pro Lys Trp Ser Lys Tyr Met Tyr Asp Val

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Glu Lys Tyr Ile Ser Pro Tyr Gln Tyr Cys Glu Asn Pro Ala Ser Glu
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Val Arg Asp Lys Leu Tyr Val Tyr Glu Gly Leu Asp Asn Leu Lys Arg
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Ile	Ser	Glu	Lys	Met	Val	Asn	Phe	Ala	Asn	Asp	His	His		Asn		
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Lys	Asp	Val	Glu	Lys	Tyr	Ile	Ser	Pro	Tyr	His	Asp	Ser	Gln	Asp	Pro	
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Ala	Lys	Glu	Met	Arg	Lys	Val	Leu	Glu	Lys	Val	Gly	Tyr	Val	Asp	Tyr	
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Met	Glu	Glu	Asp	Phe	Lys	Gln	Asp	Tyr	Leu	Asn	Ile	Leu	Lys	Asp	Met	
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Lys	Ile	Val	Ser	Lys	Tyr	Asn	Thr	Asp	Glu	Ala	Ser	Val	Asn	Phe	Lys	
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Lys Ser Ile Ser Asn Ile Leu Asp Val Gly Cys Gly Asp Gly Cys Val
35 40 45

Thr Ser Met Leu Lys Lys Tyr Ile Pro Thr Asp Phe Lys Leu Leu Gly
50 55 60

Cys Asp Ile Ser Glu Lys Met Val Asn Phe Ala Asn Asp His His Cys
65 70 75 80

Asn Glu Gln Thr Ser Phe Thr Val Leu Asp Ile Ala Gly Asp Ile Pro
85 90 95

Glu Gly Met Lys Gly Lys Phe Asp His Val Phe Ser Phe Tyr Ala Leu

100 105 110

His Trp Val Leu Asp Gln Glu Arg Val Phe Arg Asn Ile Tyr Asp Leu
115 120 125

Leu Ser Lys Asp Gly Glu Cys Phe Thr Ile Phe Val Ala Gly Ala Pro
130 135 140

Val Phe Asp Leu Tyr Arg Ile Leu Ser Arg Asn Asn Lys Trp Ser Thr

145 150 155 160

Leu Leu Lys Asp Val Glu Lys Tyr Ile Ser Pro Tyr His Asp Ser Gln
165 170 175

Asp Pro Ala Lys Glu Met Arg Lys Val Leu Glu Lys Val Gly Tyr Val
180 185 190

Asp Tyr Lys Val Glu Cys Lys Asn Leu Val Tyr Met Tyr Asn Asn Phe
195 200 205

Ala Ser Leu Trp Lys Thr Leu Gln Ala Ile Asn Pro Phe Asn Ile Pro 210 215 220

Lys Asp Met Glu Glu Asp Phe Lys Gln Asp Tyr Leu Asn Ile Leu Lys 225 230 235 240

Asp Met Lys Ile Val Ser Lys Tyr Asn Thr Asp Glu Ala Ser Val Asn
245
250
255

Phe Lys Tyr Arg Leu Leu Val Val His Ala Arg Lys Pro Ala Ser Glu 260 265 270

Phe

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acte	gtcc	gcc į	gaaa	ccgc	gc t	tcac	tcaa	c cad	cgcgo	cacg	cgca	accc	gaa a	aata	aataac		60
aaga	aatca	ata a	aacta	aaaca	aa at	tcaa	tatca	a cga	aaati	tcaa	ata	ccta	taa a	aaaa	atcctt		120
aaa	atg	aat	aac	gcg	gtc	ttg	tat	gaa	aaa	agc	aat	agc	ttg	cag	aag		168
	Met	Asn	Asn	Ala	Val	Leu	Tyr	Glu	Lys	Ser	Asn	Ser	Leu	Gln	Lys		
	1				5					10					15		
aga	gat	gct	atc	atg	tgt	cta	gaa	gaa	tac	gct	tcg	aaa	att	aag	tgg	:	216
Arg	Asp	Ala	Ile	Met	Cys	Leu	Glu	Glu	Tyr	Ala	Ser	Lys	Ile	Lys	Trp		
				20					25					30			
aag	aag	agt	aat	aat	aat	att	ctt	gac	ata	ggc	tgt	ggg	gat	gga	agc	1	264
Lys	Lys	Ser	Asn	Asn	Asn	Ile	Leu	Asp	Ile	Gly	Cys	Gly	Asp	Gly	Ser		
			35					40					45				

gtg	act	aat	atg	ctg	aag	aaa	tac	atc	cct	act	gag	tac	aag	ttg	ctt	312
Val	Thr	Asn	Met	Leu	Lys	Lys	Tyr	Ile	Pro	Thr	Glu	Tyr	Lys	Leu	Leu	
		50					55					60				
ggc	tgt	gat	att	agc	gag	aag	atg	gtg	aac	ttc	gcg	aat	gat	cat	cat	360
Gly	Cys	Asp	Ile	Ser	Glu	Lys	Met	Val	Asn	Phe	Ala	Asn	Asp	His	His	
	65					70					75					
tgt	aac	gaa	cag	act	tct	ttc	acc	gtg	ctc	gat	att	gag	gga	gac	cta	408
Cys	Asn	Glu	Gln	Thr	Ser	Phe	Thr	Val	Leu	Asp	Ile	Glu	Gly	Asp	Leu	
80					85					90					95	
cct	gaa	ggt	atg	aag	gga	aac	ttc	gac	cac	gtt	ttc	tcg	ttc	tac	gct	456
Pro	Glu	Gly	Met	Lys	Gly	Asn	Phe	Asp	His	Val	Phe	Ser	Phe	Tyr	Ala	
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ctg	cac	tgg	gtt	aat	aac	caa	gaa	cga	gca	ttc	aaa	aac	ata	tac	aac	504
Leu	His	Trp	Val	Asn	Asn	Gln	Glu	Arg	Ala	Phe	Lys	Asn	Ile	Tyr	Asn	
			115					120					125			
ctt	cta	agc	gag	gat	ggg	gag	tgc	ttc	acg	ata	ttc	gta	gcc	tgg	gct	552
Leu	Leu	Ser	Glu	Asp	Gly	Glu	Cys	Phe	Thr	Ile	Phe	Val	Ala	Trp	Ala	
		130					135					140				
cct	gtg	ttt	gac	gtg	tac	cga	gtg	ctc	gcg	cgc	aac	aac	aag	tgg	agt ·	600

Pro Val Phe Asp Val Tyr Arg Val Leu Ala Arg Asn Asn Lys Trp Ser

caa	tgg	gtg	cat	gat	gtc	gac	aga	tac	ata	tcg	ccc	tac	cac	gac	tct	64	8
Gln	Trp	Val	His	Asp	Val	Asp	Arg	Tyr	Ile	Ser	Pro	Tyr	His	Asp	Ser		
160					165					170					175		
ttg	gag	ccg	gaa	aaa	gat	tta	aag	gct	atg	ata	gac	aaa	att	gga	ttc	69	6
Leu	Glu	Pro	Glu	Lys	Asp	Leu	Lys	Ala	Met	Ile	Asp	Lys	Ile	Gly	Phe		
				180					185					190			
gtt	gac	atc	gat	gtg	gaa	tgt	aaa	gaa	ttg	gta	ttc	gtg	tac	gac	aac	74	4
Val	Asp	Ile		Val	Glu	Cys	Lys		Leu	Val	Phe	Val		Asp	Asn		
			195					200					205				
												4			_4_	70	0
														aaa		79	2
11e	піѕ	210	Leu	Arg	Lys	Ala	215	ınr	AIS	11e	ASN	220	rne	Lys	11e		
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ccc	ลลด	gaa	ааа	tat	gat.	gat.	tte	atø	gaa	gac	tat.	at.ø	gat.	ata	ctg	84	0
												_	_	Ile	_	01	•
	225		-,-	-,-		230					235						
aaa	gaa	cta	caa	att	tta	gac	aag	tac	aac	aat	aat	tat	gaa	aag	agc	88	8
Lys	Glu	Leu	Gln	Ile	Leu	Asp	Lys	Tyr	Asn	Asn	Asn	Tyr	Glu	Lys	Ser		
240					245					250					255		

gtt gaa ttc aat tac cgt ttg ctt gta gtg tat gcc cga aaa cct gac	936
Val Glu Phe Asn Tyr Arg Leu Leu Val Val Tyr Ala Arg Lys Pro Asp	
260 265 270	
tcg cag gat aaa atg tta gaa gct cta aat gga caa acg tag	978
Ser Gln Asp Lys Met Leu Glu Ala Leu Asn Gly Gln Thr	
275 280	
210	
actgaaaaac ttatattttt agttacggca aaatacagtg tagaacagtt atttgtagt	t 1038
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aaggatgaat gtatagtgta tetetteagg tttagttttg ggeetggtat gaaatgttg	t 1098
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Lys Ser Asn Asn Ile Leu Asp Ile Gly Cys Gly Asp Gly Ser Val
35 40 45

Thr Asn Met Leu Lys Lys Tyr Ile Pro Thr Glu Tyr Lys Leu Leu Gly
50 55 60

Cys Asp Ile Ser Glu Lys Met Val Asn Phe Ala Asn Asp His His Cys

70

75

80

Asn Glu Gln Thr Ser Phe Thr Val Leu Asp Ile Glu Gly Asp Leu Pro

85 90 95

Glu Gly Met Lys Gly Asn Phe Asp His Val Phe Ser Phe Tyr Ala Leu
100 105 110

His Trp Val Asn Asn Gln Glu Arg Ala Phe Lys Asn Ile Tyr Asn Leu
115 120 125

Leu Ser Glu Asp Gly Glu Cys Phe Thr Ile Phe Val Ala Trp Ala Pro
130 135 140

Val Phe Asp Val Tyr Arg Val Leu Ala Arg Asn Asn Lys Trp Ser Gln
145 150 155 160

Trp	Val	His	Asp	Val	Asp	Arg	Tyr	Ile	Ser	Pro	Tyr	His	Asp	Ser	Leu
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Glu Pro Glu Lys Asp Leu Lys Ala Met Ile Asp Lys Ile Gly Phe Val
180 185 190

Asp Ile Asp Val Glu Cys Lys Glu Leu Val Phe Val Tyr Asp Asn Ile
195 200 205

His Ile Leu Arg Lys Ala Leu Thr Ala Ile Asn Pro Phe Lys Ile Pro 210 215 220

Lys Glu Lys Tyr Asp Asp Phe Met Glu Asp Tyr Met Asp Ile Leu Lys
225 230 235 240

Glu Leu Gln Ile Leu Asp Lys Tyr Asn Asn Tyr Glu Lys Ser Val

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Glu Phe Asn Tyr Arg Leu Leu Val Val Tyr Ala Arg Lys Pro Asp Ser
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- <223> "n"=A, T, G or C
- <220>
- <221> misc_feature
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- ⟨211⟩ 23
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42/49

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Asp Ala

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Tyr Lys Leu Xaa Val Val Tyr Ala Arg Lys

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